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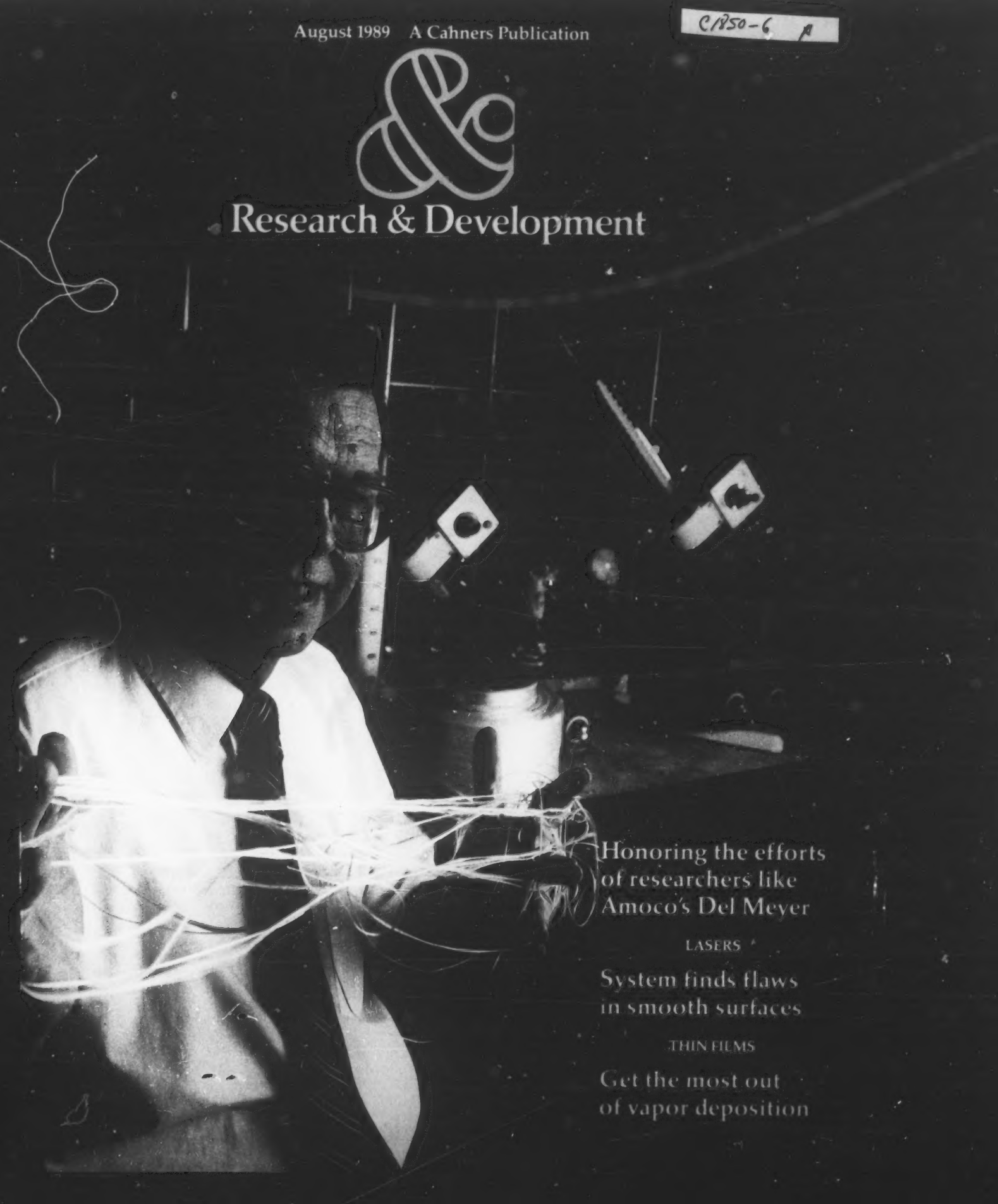
Research & Development



Honoring the efforts of researchers like Amoco's Del Meyer

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System finds flaws in smooth surfaces

THIN FILMS

Get the most out of vapor deposition

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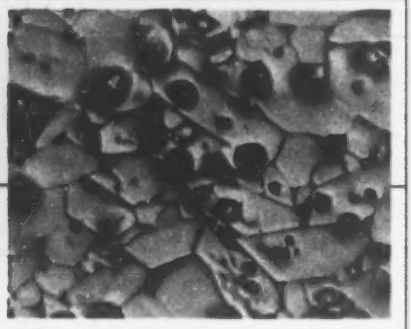

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R&D

BUSINESS

Big companies are big R&D spenders

SPENDING for R&D is still rising for the biggest U.S. corporate researchers. In its annual survey, *Inside R&D* found that R&D spending increased 10.7% to $48.8 billion in 1988 for the top 100 spenders.

While mergers, buyouts, and restructurings may have slowed R&D investment by smaller companies, the 1988 increase exceeds that of 1987 by 6.4%.

The top 10 companies, which account for 44% ($21.6 billion) of the spending by the top 100, are the same companies as in the 1987 survey.

Of the top 100 spenders, the 3 companies with the largest R&D spending increases were Sun Microsystems (101.1%), Genentech (65.1%), and Prime Computer (58.9%). Companies that still made the top 100 list but which had significantly reduced their spending include Advanced Micro Devices (−15.9%), Perkin-Elmer (−14.7%), and Westinghouse Electric (−11.5%).

Minimum spending for getting on the list was $93 million, up from $81.5 million in 1987. □

U.S. manufacturers get serious about lost semiconductor market

U.S. MANUFACTURERS took a significant step in late June toward bolstering their capabilities to compete in the world semiconductor market.

In an unprecedented decision, seven U.S. companies agreed to form U.S. Memories Inc., a joint venture to manufacture basic memory chips.

This venture presents interesting challenges to both Federal antitrust officials and Japanese memory manufacturers. To satisfy the U.S. Justice Dept., U.S. Memories will have to ensure that it is not a threat to existing U.S. competitors.

Both the Feds and the Japanese are closemouthed for the time being. They're waiting to see if Sanford Kane, president and CEO of the newly formed company, can really raise the $500 million he says is necessary to start the company. To take charge of U.S. Memories, Kane resigned his position as a vice president at IBM.

***U.S. Memories** president Sanford Kane says at least $500 million is needed from joint venture founders and other investors to start making 4-Mbit DRAMs.*

The seven companies that contributed $50,000 each to develop an initial business plan are IBM Corp., Digital Equipment Corp., Hewlett-Packard Co., Intel Corp., National Semiconductor Corp., Advanced Micro Devices Inc., and LSI Logic Corp.

The initial U.S. Memories product will be 4-Mbit dynamic random access memory (DRAM) chips. The design and manufacturing technology for these devices will be licensed from IBM. "By licensing IBM's design, U.S. Memories will have the jump start needed to quickly come on line as a serious player," said Gordon Moore, chairman of the Semiconductor Industry Assn. and chairman of Intel Corp.

While DRAM technology was invented in the U.S., Japanese competition drove all but Texas Instruments and Micron Technology out of the business (Motorola reentered the market earlier this year after agreeing to license Toshiba technology.)

Today, Japan's Toshiba Corp., NEC Corp., Mitsubishi Electric Corp., Hitachi Ltd., and Fujitsu Ltd. have 87% of the 1-Mbit DRAM world market. The U.S. has only 7%.

The world market for DRAMs is large, with $11 billion in sales expected in 1989 and $22 billion in 1993 according to Dataquest Inc., an industry analysis group. Profitability is high, with estimates of $2 billion in

Top 10 U.S. spenders on R&D

Rank 1988	Rank 1987	Company	R&D spending (billions of U.S. dollars)	Change from 1987 (%)
1	1	General Motors	4.75	9.0
2	2	IBM	4.42	10.5
3	3	Ford Motor	2.93	16.5
4	4	AT&T	2.57	4.9
5	5	DuPont	1.32	7.9
6	7	Digital Equipment	1.31	29.3
7	6	General Electric	1.16	3.3
8	8	Eastman Kodak	1.15	15.6
9	9	Hewlett-Packard	1.02	13.1
10	10	United Technologies	0.93	6.1

Source: *Inside R&D*

The top 10 U.S. companies that spent the most for R&D in 1988 are unchanged from 1987. These companies account for 44% of the R&D spending by the top 100 companies.

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*Domestic
†Foreign

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